THE UNIVERSITY OF MELBOURNE

**Key points:**

- MOGLabs has annual sales of $3 million
- Supplies high-performance laser technology to research labs
- Founded by Professor Robert Scholten and Mr Aleksander Slavec of the University of Melbourne

# MOGLabs

## Precision laser technology for quantum physics researchers

### The outcome

MOG Laboratories Pty Ltd (MOGLabs), launched in 2007, fills a gap in the provision of high-performance laser technology for researchers in quantum physics.

Through a process of incremental innovation, MOGLabs has developed ergonomic, easy to use and affordable tunable lasers, laser electronics and instrumentation, optical amplifiers, radio frequency synthesisers and laser wavelength measurement devices.

Founded by University of Melbourne researchers, the company has annual sales of $3 million, with potential to grow into the tens of millions.

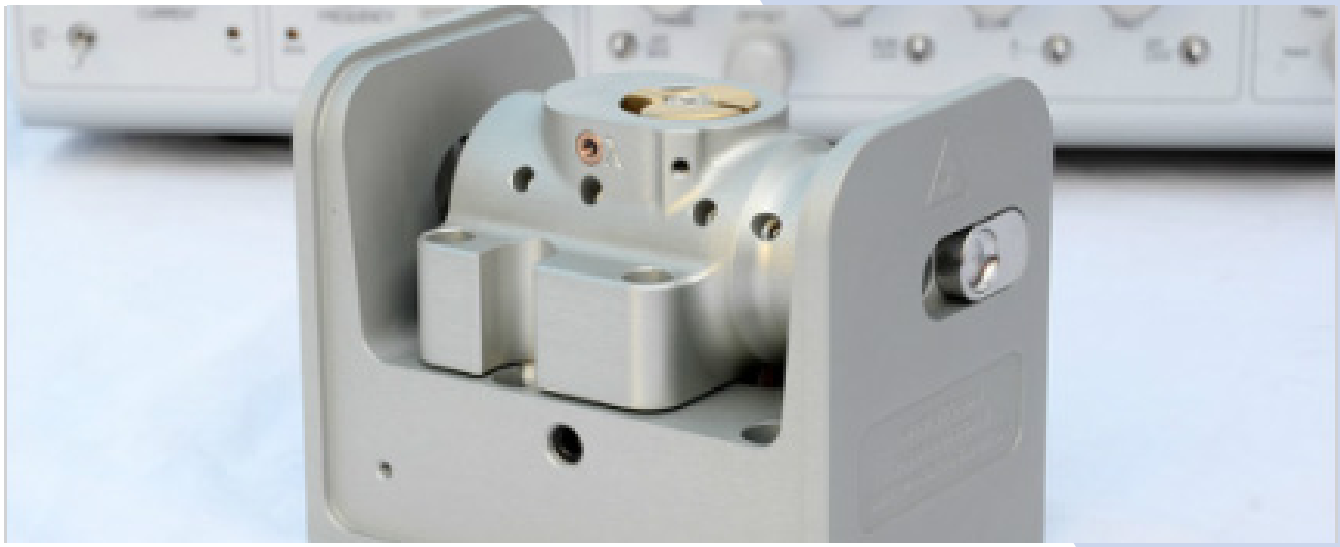
It employs 15 staff and is based in Carlton, Victoria, with sales offices in the USA and Germany.

### The need

Tunable lasers are used in many research and industrial commercial applications in quantum science and technology, such as computing and simulation, atomic clocks, imaging, sensing and measurement, and communications.

Sophisticated electronics are required to control the power, temperature and wavelength of these lasers. Building this instrumentation is difficult and time-consuming for researchers and, until MOGLabs entered the market, commercially available products were hard to source and expensive.

MOGLabs currently supplies high-performance laser technology to research labs. The market for MOGLabs technology is expected to grow as applications for quantum science and technology expand into diverse sectors. These include data security; banking and telecommunications; defence and aerospace; civil engineering; and natural resource exploration (for example, ultrasensitive measurements of gravity using ultra-cold atoms to detect mineral deposits).



*MOGLabs sells ergonomic, easy to use and affordable high-performance laser technology to quantum physicists. Picture: MOGLabs*

## The science

In 2004, dissatisfied with commercially available laser instrumentation, Professor Robert Scholten from the University of Melbourne began to make his own. The devices comprised all the electronics necessary to operate a research-quality tunable laser.

Rather than inventing novel technology, Scholten used existing knowledge from optics and physics to create high-precision instrumentation for fellow researchers. He and his University of Melbourne colleague, electrical engineer Mr Aleksander Slavec, also borrowed from related fields: for example, they adopted aspects of high-fidelity audio technology to eliminate the noise that can adversely affect laser performance.

## Technology development history

Professor Robert Scholten and Alex Slavec launched MOGLabs in 2007.

Under a three-year licensing deal with the University of Melbourne, the pair provided their own funding, making the devices in their homes and selling them to research laboratories worldwide. The University then transferred the intellectual property to MOGLabs, which is continuing to develop the instrumentation.

MOGLabs has been awarded $760,000 over two Australian Research Council (ARC) Linkage Project grants (2013 and 2015) to further develop and commercialise its laser technology. It is also a participating member of the ARC Centre of Excellence for Engineered Quantum Systems (EQuS), which was launched in 2017 with $31.9 million funding over seven years. MOGLabs is an industry partner with the University of Melbourne in two Innovation Connections grants, part of the Australian Government's Entrepreneurs' Programme.

Professor Scholten is the Managing Director of MOGLabs, and he continues his research in the Atom Optics Group in the School of Physics.

### Players, publications and patents

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| **Company:** | MOG Laboratories Pty Ltd |
| **Researchers:** | Professor Robert Scholten, Alex Slavec |
| **Patents and key publications:** | Hawthorn CJ, Weber KP, Scholten RE. 2001. Littrow configuration tunable external cavity diode laser with fixed direction output beam. Rev Sci Instrum 72(12):4477-4479. doi:10.1063/1.1419217 |

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